Topic 04-Valvular heart disease and general cardiology

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0079

Respective performances of FDG-PET and radiolabeled leukocyte scintigraphy for the diagnostic of prosthetic valve endocarditis

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Purpose: The incremental diagnostic value of 18-fluorodeoxyglucose positron emission tomography (FDG-PET) and radiolabeled leukocyte scintigraphy (LS) has already been reported in infective endocarditis (IE) patients. The aim of this study was to compare the respective performances of FDG-PET and LS for the diagnosis of prosthetic valve (PVE)-IE in 39 patients.

Methods: FDG-PET and LS were performed in 39 consecutive patients admitted for a clinical suspicion of PVE and inconclusive echocardiography who underwent both FDG-PET and LS. FDG-PET and LS were analysed separately and retrospectively by experienced physicians blinded to the results of the other imaging technique and to patient's outcome. Final Duke-Li IE classification was performed after a 3-month follow-up period.

Results: Out of the 39 patients, 15 patients were classified after a 3-month follow-up period as definite IE, 3 as possible IE and 21 as excluded IE. Average time interval between FDG-PET and LS acquisitions was 7±7 days. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were 93%, 71%, 70%, 94% and 81% for FDG-PET and 60%, 100%, 100%, 78% and 83% for LS, respectively. Discrepancies between the results of FDG-PET and LS occurred in 12 patients (31%). In patients with definite IE, 5 were identified with true positive FDG-PET but false negative LS. Out of these 5 patients, 3 presented non-pyogenic microorganism IE (Coxiella or Candida). In patients with excluded endocarditis, 6 patients were identified with true negative LS but false positive FDG-PET. These 6 patients had been imaged in the first two months following the last cardiac surgery.

Conclusions: FDG-PET offers a high sensitivity for the detection of active infection in patients with a suspicion of PVE. LS offers a higher specificity than FDG-PET for IE diagnosis and should be considered in case of inconclusive FDG-PET findings or in the first two months after cardiac surgery.

0084

Left atrial systolic dysfunction and prognosis in severe aortic stenosis

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Introduction: Left atrial (LA) size has recently emerged as a prognostic factor in patients with valvular heart disease.

Aim of the study is to determine the utility of LA systolic function in patients with aortic stenosis (AS)

Methods: we studied 178 patients (mean age 79.6±0.6 years) with severe AS who underwent 2D echocardiography for the assessment of left ventricular (LV) and right ventricular (RV) function, LA size, aortic valve morphology and gradients. Peak LA strain (pLAS) measured by 2D speckle tracking echocardiography (STE) was used to evaluate LA contractility. A pLAS ≤23% – the indicated referral limit in normal population – was considered as an index of impaired LA contractility.

Results: A pLAS ≤23% was very common in patients with AS (n=139, 79%). Patients with reduced pLAS had greater LA volume (52.9±15.7 vs 36.6±7.8ml/m², p<0.0001), reduced LV ejection fraction (54.2±12.8 vs 61.5±7.7%, p=0.001), reduced TAPSE (19.9±4.3 vs 22.3±4.0mm, p=0.003), a more severe aortic stenosis (aortic surface: 0.40±0.09 vs 0.48±0.13 cm²/m², p<0.0001) and higher lnNT-proBNP (7.6±1.3 vs 6.1±1.4, p<0.0001) levels. The main factors associated with pLAS were: left ventricular global longitudinal strain, lnNT-proBNP, indexed LA volume, and TAPSE (β=–0.58, – 0.56, – 0.51 and – 0.43 respectively; all p<0.0001). At Kaplan-Meyer analysis, a reduced pLAS was associated with increased all cause mortality and major adverse cardiovascular events (MACEs) (Log Rank test p=0.05 and P=0.008 respectively).

Conclusions: in patients with AS, LA systolic dysfunction is very common and is associated with LA dilatation and biventricular impairment. A reduced survival and a significantly higher recurrence of MACEs were also observed in these population. Further studies, exploring LA relaxation and overall dynamics are necessary to support the utility of quantitative echocardiographic assessment of LA function as an additional tool to guide management of patients with AS.

0110

Exercise stress echocardiography in secondary mitral regurgitation: impact of pulmonary hypertension

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Background: Secondary mitral regurgitation (MR) is a serious and frequent complication of dilated cardiomyopathy and/or coronary artery disease. The impact of exerxise pulmonary hypertension (ExPHT) on outcome in patients with secondary MR is unknown.

Method and results: All patients with secondary MR, sinus rhythms, narrow QRS (<120ms) and referred for exercise stress echocardiography with quantifiable exercise systolic pulmonary arterial pressure (SPAP), were included in this study (n=159, 65±11 years, 66% of male). Resting and ExPHT were defined as a systolic pulmonary arterial pressure (SPAP) >50mmHg and >60mmHg, respectively. ExPHT was more frequent than resting PHT (40% vs. 13%, p<0.0001). There was no significant difference between patients with or without ExPHT regarding demographic and clinical data, as well as medication. Using multiple linear regression, exercise SPAP was determined by resting SPAP (β=0.94±0.1, p<0.0001), exercise MR severity (β=0.58±0.1, p<0.0001), and resting e'-wave velocity (β=–1.3±0.4, p=0.004). During a mean follow-up of 35±11 months, 60 major adverse cardiovascular events occured. The incidence of combined cardiac event was significantly higher in patients with ExPHT as compared to those without ExPHT (2-year: 11±3 vs. 28±6%; 4-year: 20±5 vs. 40±7%, p<0.0001). Similarly, patients with ExPHT demonstrated significantly reduced survival (2-year: 88±4 vs. 99±1%; 4-year: 62±8% vs. 94±2%, p<0.0001). In multivariate Cox proportional Hazard model, after adjustment for age, sex, left ventricular volumes, both resting and exercise diastolic function and resting MR severity, ExPHT remains significantly associated with high risk of combined cardiac event (Hazard ratio=3.7, 95% of CI: 1.9-7.2, p<0.0001).

Conclusion: In patients with secondary MR, ExPHT may be frequent and mainly determined by resting SPAP, LV diastolic burden markers and exercise MR severity. ExPHT is a powerful predictor of poor outcome and is associated with a 3.7-fold increase in risk of cardiac event. These results further highlight the usefulness of exercise stress echocardiography for the management and the risk stratification of these patients.

0111

Prognostic impact of global left ventricular hemodynamic afterload in severe aortic stenosis with preserved ejection fraction: a cardiac catheterization-based study

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Background: The global left ventricular (LV) hemodynamic afterload as assessed by valvulo arterial impedance (Zva), may be an independent pre-

dictor of mortality in patients with severe aortic stenosis (AS) and preserved LV ejection fraction (LVEF). However, its quantification using echocardiography may be subject to error measurement. The aim of this study is to determine the prevalence and impact on long-term survival of high Zva, purposely measured by cardiac catheterization.

Methods and Results: 768 patients with preserved LVEF (>50%) and severe AS (valve area ≤1cm²) underwent cardiac catheterization. Zva was derived from catheterization data and calculated using validated formula. Zva was considered high when > 5 mmHg/mL/m^2. Overall, high Zva was found in 42% of all AS patients.

Patients with high Zva were significantly older (p<0.0001), and more often female (p< 0.0001), they had significantly smaller aortic valve area (p<0.0001), higher mean gradient (p=0.001), lower indexed stroke volume (p<0.0001) and cardiac output (p<0.0001), significantly higher LVED filling pressures (p=0.03), systolic pulmonary artery pressure (p=0.0005), higher capillary wedge pressure(p=0.006), reduced systemic arterial compliance (p<0.0001), but higher systemic vascular resistances(p<0.0001).

Ten-year survival was significantly reduced in patients with higher Zva (50±5%) as compared to those with lower Zva (67±3%; p=0.01). After adjustment for all other risk factors, Zva was independently associated with reduced long-term survival (hazard ratio [HR] =1.12 95% CI: 1.009-1.22; p=0.03). Of interest, high Zva remains associated with reduced survival as compared to low Zva, in patients with normal LV stroke volume, but was no longer significant in low flow patients (>60mL: 49±8vs. 69±4%, p=0.012; ≤60mL: 49±7 vs. 53±13%, p=0.96).

Conclusion: In this large cardiac catheterization-based study, high Zva estimated invasively is frequent in patients with severe AS, and appears as a robust and independent predictor of survival.

0543

Marfan syndrome diagnosed during childhood: focus on cardiac events in the French database

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Life expectancy of patients with Marfan syndrome has increased, due to earlier diagnosis, better familial screening, regular follow-up (FU) and timely prophylactic aortic surgery (PASu). Incidence of aortic events in affected patients recognized during childhood is unknown.

Methods: 465 patients with Marfan syndrome, diagnosed before 18 year-old between 1993 and 2013 were included in the French multicenter database. Cardio-vascular events (death, aortic dissection or PASu) were recorded

Results: FU was complete for 69.5%. A cardio-vascular event occurred in 25 patients (5.4% 95CI 3.5-7.8%), including PASu (n=20, 4.3% 95CI 2.5-6.2%), aortic dissection (n=3, 0.6% 95CI 0.0-1.4%) and deaths (n=2, 0.4% 95CI 0.0-1.0%). 16 events (64%) occurred before 19 year-old (Median 15.0, min 2.8, interquartile 11.7-16.3; PASu n=12, deaths n=2 and dissection n= 2). One sudden death occurred in a 18 y.o. girl followed until the age of 14.3 under beta-blockade treatment. A 3.4 year-old boy with a FBN1 mutation diagnosed at the age of 1.1 died from respiratory distress and viral myocarditis.

An aortic surgery was performed in 23 patients (4.9%, 95CI 3.0-6.9%), including a Bentall procedure with mechanical aortic valve in 10 (43.5%), a valve sparing surgery in the remaining 13 (56.5%) and a supra-coronary graft in 4 (17.4%, dissection: n=2 and PASu: n=2). Mean age at the date of PASu was 17.1±6.5 year-old

Events occurred before or at inclusion in the database in 8 patients (32.0%) (PASu n=5, dissection n=2, death n=1). Dissection was observed before inclusion in 2 patients out of 3 and during pregnancy in 1 patient aged 25 and lost of FU until 19 year-old. Kaplan-Meier survival estimate indicates that 95% of patients remained free from events at eighteen and 78% at thirty year-old.

Conclusion: Prophylactic surgery for enlarged aorta is the main cause of cardiac events in patients with Marfan syndrome diagnosed during childhood. A quarter of them have a cardiac event before thirty year-old (figure next page).

0031

Performance of systematic search for present and potential portals of entry of infective endocarditis

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Infective endocarditis (IE) is a severe disease, with an in-hospital mortality around 20%. 10% of the patients will have another episode of IE. Thus, looking for and treating the portal of entry of IE is particularly important. Yet, literature on this topic is nonexistent.

Since January 2005, we have been prospectively enrolling patients hospitalized for certain IE (Duke-Li criteria) in the International Collaboration on Endocarditis database. Since then, we have been systematically looking for and treating the portal of entry of the present IE episode and potential portals of entry of a new IE episode.

Among 444 patients hospitalized in our institution between 2005 and 2011, 318 were included in the present study (exclusion of patients who died during hospitalization; some medical charts unavailable for technical reasons).

Portal of entry of the present IE episode was identified in 238 patients (74%). Distribution of identified portals of entry was: cutaneous: 44% (healthcare-associated: 21%; community-acquired: 13%; IV drug use: 9%); oral / dental: 29%; gastrointestinal: 22%; genitourinary: 3%; ENT: 2%; respiratory: 1%.

Potential portals of entry were: continuation of IV drug use in 21 patients and a cutaneous disease in 2 patients; oral / dental infective foci in 66 / 125 patients with stomatologic examination; colonic lesions (polyps, diverticulosis, adenocarcinoma) in 32 / 80 patients in whom colonoscopy was performed because they were ≥50 years old or they had a familial history of colonic polyposis; genitourinary lesions (prostatic cancer or hyperplasia, urethral stenosis...) in 32 / 52 patients with genitourinary examination; ENT lesions (sinusitis, otomastoidosis...) in 6 / 180 examinations.

In conclusion, systematic search for the portal of entry of IE was successful in as many as ¾ of patients. Systematically searching for a potential oral / dental, gastrointestinal or genitourinary portal of entry of a new IE episode was also successful in a lot of patients.

0174

Clinical significance of congestive heart failure in prosthetic valve endocarditis. An Algeria multicenter study with 157 patients

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Introduction and objectives: There have few studies conducted in the past that focus on the significance of congestive heart failure in patients with prosthetic valve endocarditis. We studied the incidence of congestive heart failure in patients with prosthetic valve endocarditis and analyzed its profileI, and we addressed the prognostic significance of heart failure in patients with prosthetic valve endocarditis.